-1040-251-15

TM 3-1040-251-15

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL,
DIRECT SUPPORT, GENERAL SUPPORT,
AND DEPOT MAINTENANCE MANUAL

TEST SET, FLAME THROWER– RIOT CONTROL AGENT DISPERSER HYDROSTATIC-AND-VOLUMETRIC, 6,000 PSI, M5

This copy is a reprint which includes current pages from Change 3

HEADQUARTERS, DEPARTMENT OF THE ARMY
JUNE 1967

READEX MICRO best copy available

0101.11:

SAFETY PRECAUTIONS

Always release all pressure on the test set before attempting to make any adjustments, repairs, or disassembly of the test set.

Always release all pressure on any item or unit being tested before attempting to make any connection, adjustment, repair, or disassembly.

Isolate the test apparatus and test specimens during the performance of any pressure tests.

Use a portable safety shield mounted on casters when making a visual observation for leakage. The shield must be of sufficient strength to withstand any impact resulting from a rupture of a test specimen and/or apparatus.

The test specimens and other pieces of equipment capable of being ejected in the event of a rupture must be firmly anchored.

Change in force: C 3

TM 3-1040-251-15
***C 3**

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *25 September 1970*

Operator's, Organizational, Direct Support General Support, and Depot Maintenance Manual

TEST SET, FLAME THROWER-RIOT CONTROL AGENT DISPERSER, HYDROSTATIC-AND-VOLUMETRIC, 6,000 PSI, M5

TM 3-1040-251-15, 15 June 1967, is changed as follows:

Inside front cover. "Safety precautions" is changed to read "Warnings."

Page 3. paragraph 3. In lines 8 through 12, all text after "ing)." is rescinded.
First Note after paragraph 3 is rescinded.

*This change supersedes C 2, 10 December 1968.

Page 4. **Figure 1 is superseded as follows:**

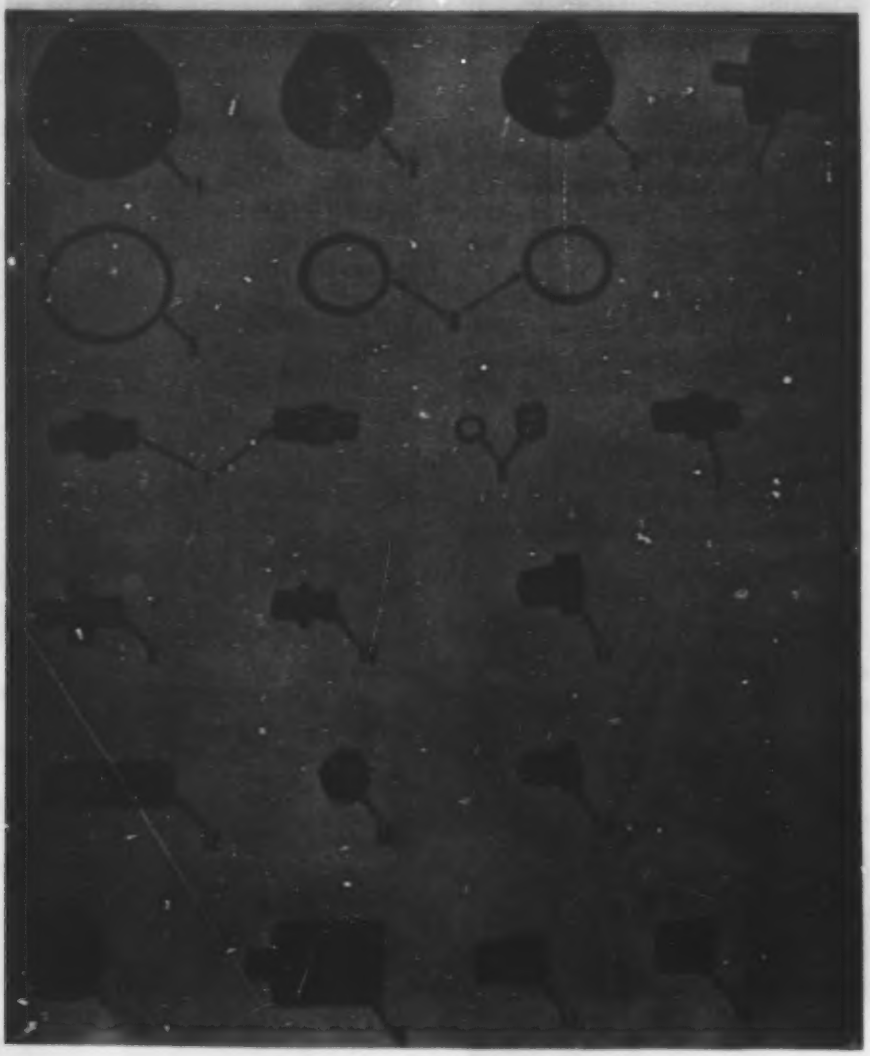
1 Pressure gage
2 Pump lever
3 Pump
4 Tubing
5 Pressure release control lever
6 Spindle assembly
7 Large tube
8 Rack assembly
9 Scale
10 Small tube
11 Test stand assembly
12 Valve assembly
13 Hose assembly
14 Pump lever handle
15 Tank drain plug
16 Tank
17 Elbow
18 Pipe nipple
19 Bleeder valve

Figure 1. M5 test set.

Page 6, **paragraph 4*b***. In lines 2 through 6, sentence is superseded as follows:

The tubes are open at the top so that test fluid can be added.

Figure 3 is superseded as follows:



1 Testing gage adapter
2 Testing gage adapter
3 Filling plug assembly
4 Tank adapter
5 Preformed packing
6 Preformed packing
7 Pipe-to-tube adapter
8 Plug assembly
9 Tube reducer
10 Check valve body
11 Diffusion pipe plug
12 Quick-disconnect coupling half
13 Plug
14 Diffusion pipe plug
15 Cap adapter
16 Reducer adapter
17 Pipe bushing
18 Pipe bushing

Figure 3. M5 test set fittings.

Page 7, paragraph 4*d*(2). In line 3, "tanks" is changed to read "tanks and disperser agent tanks."
Paragraph 4*d*(2)(*b*). Add the following:

It is also used when testing the M3 disperser agent tanks.

Paragraphs 4*d*(12), (13), and (14) are added as follows:

(12) *Cap and reducer adapters.* A cap adapter (15) and a reducer adapter (16) are used to hydrostatic test the M8 fuel hose. The cap adapter is screwed onto one end of the M8 fuel hose. The reducer adapter is screwed onto the opposite end of the fuel hose and joins the fuel hose to the 6-foot-long rubber hose assembly.

(13) *Pipe bushing.* A pipe bushing (17) is used to adapt the straight pipe-to-tube adapter to the agent tank of the M5 disperser. The male threads are 3/8–18 NPT, and the female threads are 1/4–18 NPT.

(14) *Pipe bushing.* A pipe bushing (18) is used to adapt the straight pipe-to-tube adapter to the air cylinders of the M5 disperser. The male threads are 1/2–14 NPT, and the female threads are 1/4–18 NPT.

Page 8, paragraph 7*c*. Add the following:

Agent tank (M5 disperser)	125 psi
Air cylinder (M5 disperser)	3,750 psi
M8 hose (when tested separately)	625 psi

Page 11, paragraph 11. In line 9, "12" is changed to read "13."

Page 13, paragraph 13*b*(7). In line 3, "it" is changed to read "is."

Paragraph 13*e*(4), *note*. In line 1, "*d*(5) and (6) above" is changed to read "(5) and (6) below."

Page 14, paragraph 13*f*. In line 2, "hydrostically" is changed to read "hydrostatically."

Paragraph 13*f*. Add the following:

To test the M8 hose separately, screw the cap adapter (15, fig. 3) and reducer adapter (16) on the ends of the M8 hose. Connect the hose assembly (13, fig. 1) to the reducer adapter.

Paragraph 13*g* is added as follows:

g. Agent Tank from M5 Disperser (fig. 5.1).

(1) Position the agent tank with the valve end up.

(2) Remove the dispersion section from the agent tank and fill the tank with test fluid.

(3) Replace the dispersion section in the tank and secure with clamp.

(4) Remove plug that is in bottom of the nozzle and install pipe bushing (17, fg. 3).

(5) Install the straight pipe-to-tube adapter in pipe bushing.

(6) Connect the 6-foot rubber hose assembly to the straight pipe-to-tube adapter.

(7) Fill the pump tank with test fluid and install the tank adapter.

(8) Connect the large tube and rubber tubing to the tank adapter.

(9) Fill the large tube with test fluid and open the gage bleeder valve two turns until test fluid bleeds out. Close the bleeder valve. Bleed the trapped air from the test set by operating the pump several times. Notify the operator that the test set is ready for use to perform the test prescribed in paragraph 14.

Paragraph 13*h* is added as follows:

h. Air Cylinders for M5 Disperser (fig. 5.2). The M5 disperser has two air cylinders. The right-hand cylinder can be tested without removing it from the support section, but the left-hand cylinder must be removed from the support section to remove the connector block.

(1) Remove the adapter from the air cylinder and fill the air cylinder with test fluid.

(2) Install pipe bushing (18, fig. 3) in the neck of the cylinder.

(3) Install the straight pipe-to-tube adapter in the pipe bushing.

(4) Connect the 6-foot rubber hose assembly to the straight pipe-to-tube adapter.

(5) Fill the pump tank with test fluid and install the tank adapter.

(6) Connect the small tube and rubber tubing to the tank adapter.

(7) Fill the small tube assemlly with test fluid and open the gage bleeder valve. Bleed the trapped air from the test set by operating the pump several times. Notify the operator that the test set is ready for use to perform the test prescribed in paragraph 14.

Figure 5.1 is added as follows:

Figure 5.1. M5 dispenser agent tank attached to the test set for volumetric test.

Figure 5.2 is added as follows:

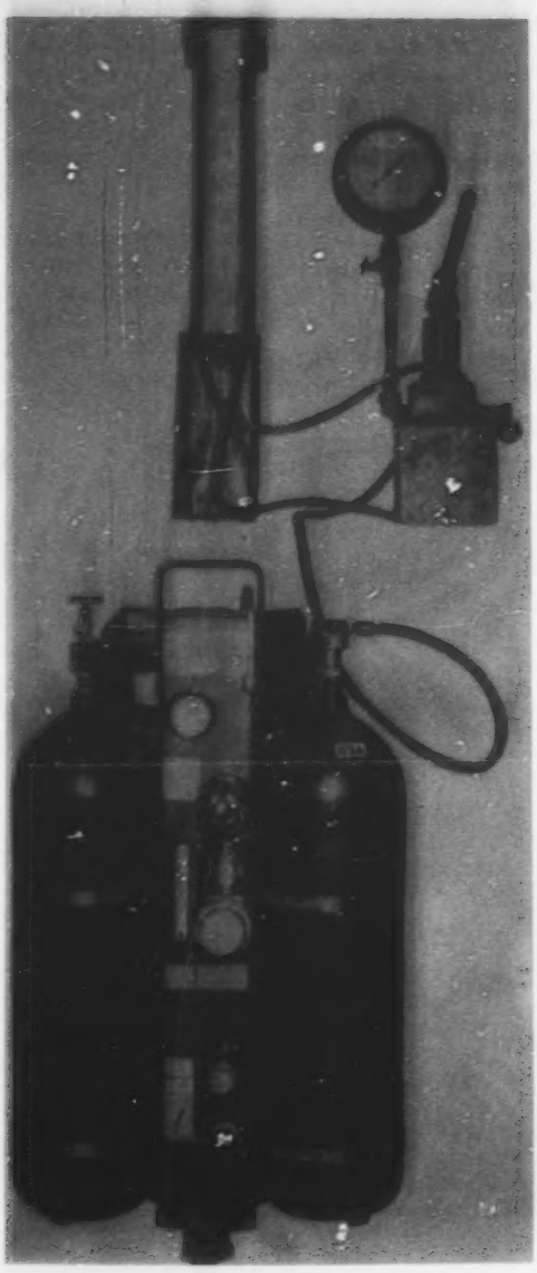


Figure 5.2. M5 dispenser air cylinder attached to the test set for volumetric test.

Page 15. paragraph 14*a*(8). Add the following:

Subtract the reading observed here from the reading observed at the start of the test. This is the total temporary expansion of the fuel tank.

Paragraph 14*a*(11). In line 10, "200" is changed to read "220."

Page 17. Paragraph 14*h* is added as follows:

h. M8 Hose. Screw the cap adapter (15, fig. 3) onto one end of the M8 hose. Screw the reducer adapter (16) onto the other end of the M8 hose. Connect the hose assembly (13, fig. 1) to the reducer adapter and hydrostatically test to the pressure of 625 psi (fig. 13).

Paragraph 14*i* is added as follows:

i. M5 Disperser Agent Tank. TM 3–1040–220–12 describes the agent tank for the M5 disperser. A pipe bushing (17, fig. 3) from the M5 test set is required to replace the pipe plug in the bottom of the tank nozzle. Perform the test procedure as prescribed in *a* above, except that the test pressure is 125 psi.

Paragraph 14*j* is added as follows:

j. M5 Disperser Air Cylinders. TM 3–1040–220–12 describes the air cylinders for the M5 disperser. A pipe bushing (18, fig. 3) from the M5 test set is required to replace the adapter in the neck of the air cylinder. Perform the test procedure as prescribed in *c* above, except that the test pressure is 3,750 psi.

Paragraph 15*c* is superseded as follows:

c. Items which pass the test satisfactorily shall be marked to show the latest date of hydrostatic or volumetric test. On the M2A1–7 or M9–7 portable flamethrowers and on the M3 disperser, a metal strip with the test date is attached around the neck of the pressure tank or sphere, around the diffusion tube on the fuel or agent tanks, and around the M8 hose. The M5 disperser will be marked in accordance with TM 3–1040–220–35. Items that fail the test should be destroyed to prevent accidental use.

Page 22. **Figure 13 is added as follows:**

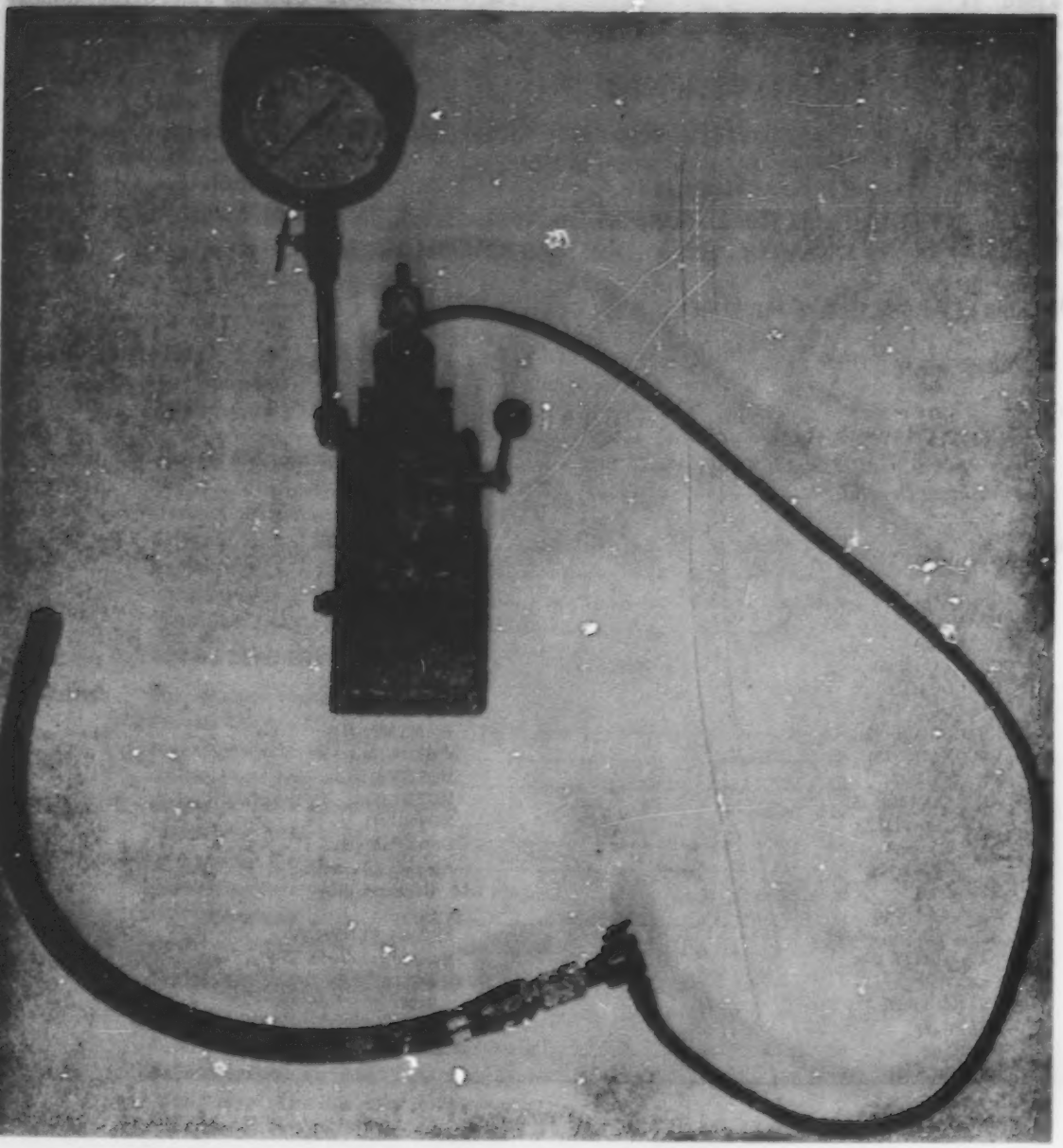


Figure 13. M8 hose attached to test set for hydrostatic test.

Page 24, paragraph 23*b*(1). In line 3, "13" is changed to read "14."
Paragraph 23*b*(2). In line 3, "14" is changed to read "15."
Paragraph 23*b*(3). In line 3, "15" is changed to read "16."
Page 25. "Figure 13" is changed to read "Figure 14."
Page 26. "Figure 14" is changed to read "Figure 15."
"Figure 15" is changed to read "Figure 16."
Page 29, paragraph 29. In line 2, "smashings" is changed to read "smashing."

Page 31, Appendix, References. Add the following:

TM 3–1040–220–12 Operator's and Organizational Maintenance Manual, Disperser, Riot Control Agent, Helicopter- or Vehicle-Mounted, M5.

TM 3–1040–220–35 Field and Depot Maintenance Manual, Disperser, Riot Control Agent, Helicopter- or Vehicle-Mounted, M5.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

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USAECFB (4)
USMA (10)
Svc Colleges (10)
Br Svc Sch (10) except
USACMLCS (50)
USAARMC (2)
USAFACFS (2)
USAPC (2)
USAIC (2)
USAMMCS (2)
USATC (1)
Gen Dep (5)
Dep (5)
Army Dep (5)
POE (1)
EAMTMTS (1)
WAMTMTS (1)
MOTBA (1)
MOTBY (1)
MOTKI (1)
MOTSU (1)
USAAPSA (25)
Arsenals (3) except
Edgewood (75)
PG (5)
Ft Knox FLDMS (10)
Units org under fol TOE:– 1 ea.
3–7
3–32
3–36
3–500

ARNG: State AG (3).
USAR: None.
For explanation of abbreviations used, see AR 310–50.

TECHNICAL MANUAL
No. 3-1040-251-15

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *15 June 1967*

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, GENERAL SUPPORT, AND DEPOT MAINTENANCE MANUAL

TEST SET, FLAME THROWER—RIOT CONTROL AGENT DISPERSER, HYDROSTATIC-AND-VOLUMETRIC, 6,000 PSI, M5

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

This manual is published for use by personnel responsible for the direct support, general support, and depot maintenance of Test Set, Flame Thrower-Riot Control Agent Disperser, Hydrostatic-and-Volumetric, 6,000 PSI, M5. It contains information on the description, operation, maintenance, shipping, storage, and destruction.

2. Records and Reports

a. Records and reports will be completed as outlined in TM 38–750.

b. The direct reporting, by the individual user, of errors, omissions, and recommendations for improving this manual is authorized and encouraged. DA Form 2028 (Recommended Changes to DA Publications) will be used for reporting these improvement recommendations. This form will be completed using pen, pencil, or typewriter and forwarded direct to Commanding Officer, Edgewood Arsenal, ATTN: SMUEA–TSE–TPE, Edgewood Arsenal, Md. 21010.

c. DD Form 6 (Report of Damaged or Improper Shipment) will be used to report damage sustained in shipment or caused by improper shipment.

3. Use

The M5 test set is used to test components of the M2A1–7 and ABC–M9–7 portable flame throwers and M3 portable riot control agent dispersers by determining whether or not the components leak under pressure (hydrostatic pressure testing) and by measuring permanent deformation under pressure (volumetric testing). The high pressure hose, fuel hose, and gun must be subjected to a hydrostatic pressure test every year. Fuel tanks and pressure tanks must be subjected to a hydrostatic and volumetric test at least once every 5 years.

Note. Hydrostatic and volumetric testing may be performed sooner than every 5 years if desired, especially if the tanks have been damaged.

Note. The M5 test set is a component of Maintenance Kit, CBR Equipment, M14 (FSN 5180–782–6049).

Section II. DESCRIPTION AND DATA

4. General

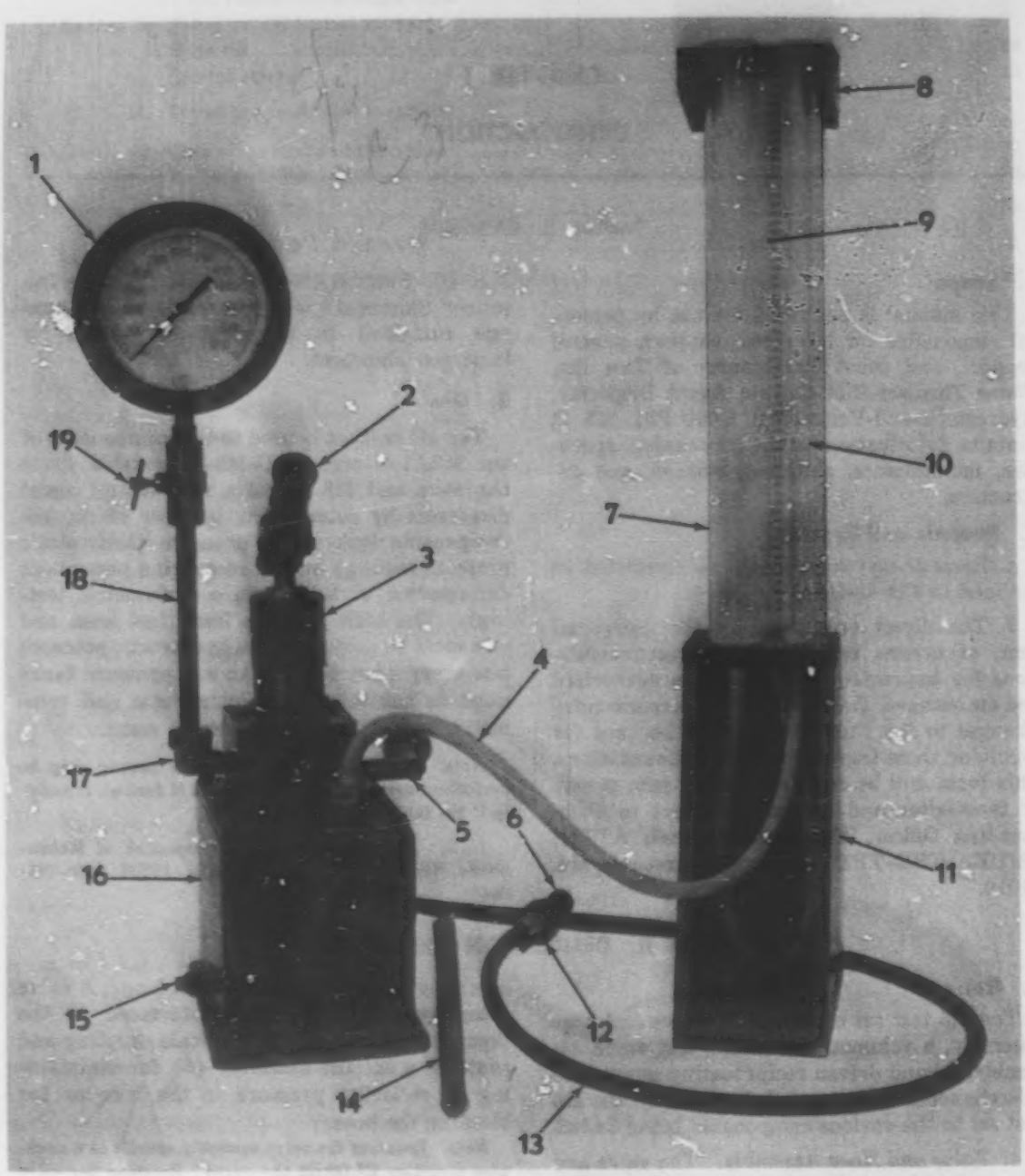
The M5 test set consists of a valve and hose assembly, a volumetric pressure test stand assembly, a hand driven reciprocating pump, and miscellaneous fittings needed to connect the M5 test set to the various components being tested.

a. Valve and Hose Assembly. The valve and hose assembly consists of a fuel and oil-resistant pneumatic hydraulic rubber hose assembly ((13), fig. 1) that contains a female coupling ((13), fig. 2) on one end and a male coupling (5) on the opposite end of the hose. The hose assembly is approximately 6 feet long. A valve assembly ((12), fig. 1) is fastened to the tapered threaded end of the male coupling and contains a spindle assembly (6) for maintaining or relieving pressure in the hose or for bleeding the hose.

Note. Rotating the valve assembly spindle in a clockwise direction CLOSES the valve. Rotating the valve assembly spindle in a counterclockwise direction OPENS the valve.

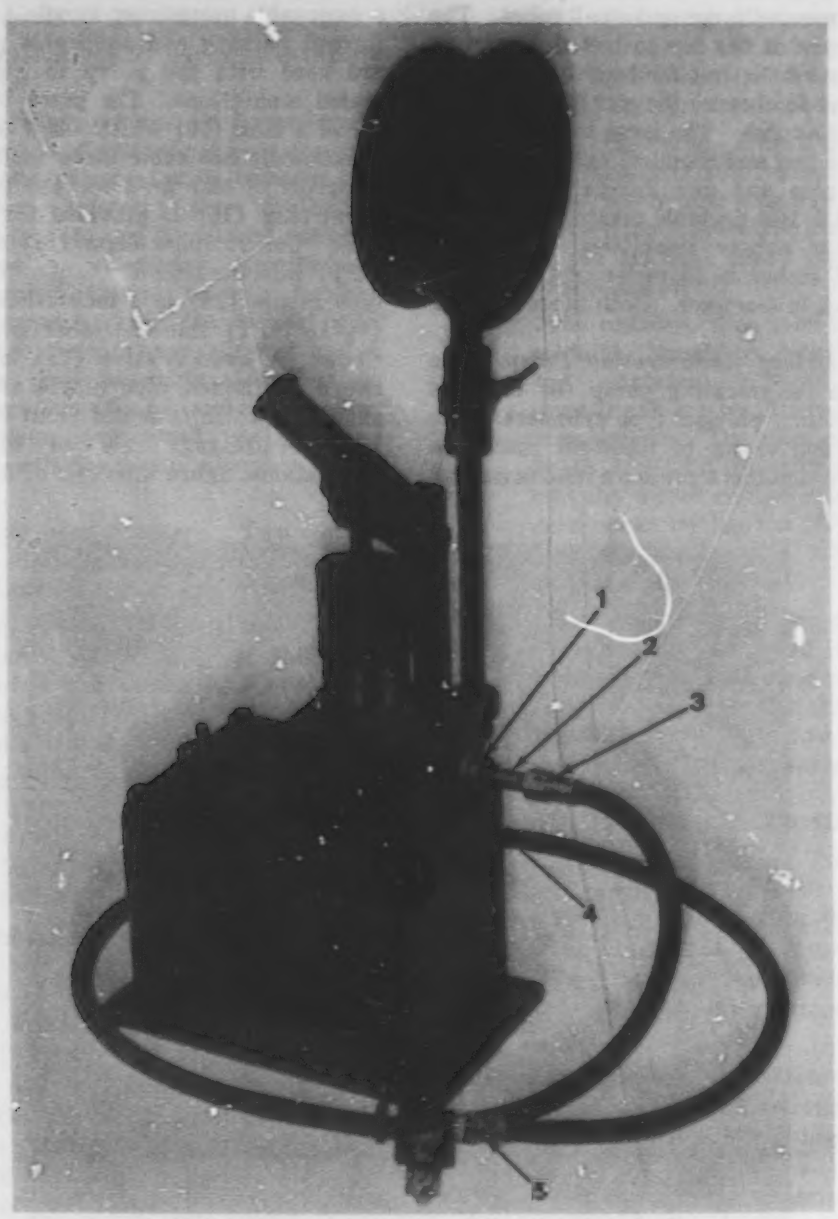
The female coupling on the hose assembly is fastened to a 2-inch long pipe nipple ((2), fig. 2) by threads (¼–18 NPT). The opposite end

of the pipe nipple is fastened to a bushing (1) that is positioned in the pressure outlet in back of the hand driven pump chamber adjacent to a pump chamber plug (4).



1	Pressure gage		control lever	10	Small tube	15	Tank drain plug
2	Pump lever	6	Spindle assembly	11	Test stand assembly	16	Tank
3	Pump	7	Large tube	12	Valve assembly	17	Elbow
4	Tubing	8	Rack assembly	13	Hose assembly	18	Pipe nipple
5	Pressure release	9	Scale	14	Pump lever handle	19	Bleeder valve

Figure 1. M5 test set.



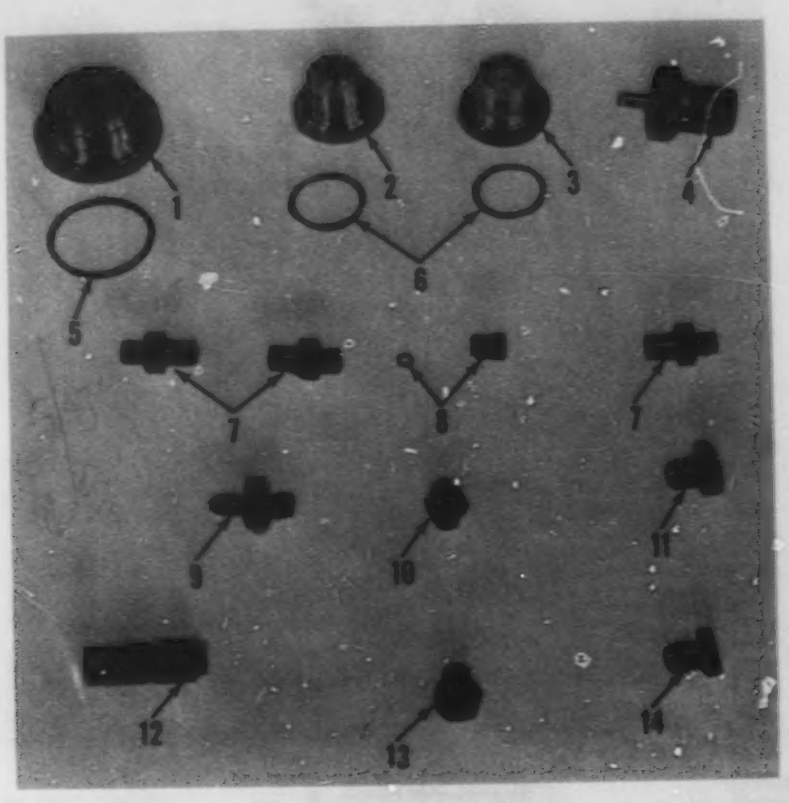
1 Bushing 2 Pipe nipple 3 Hose assembly female coupling 4 Pump chamber plug
5 Hose assembly male coupling

Figure 2. Hand driven reciprocating pump assembly—side view.

b. Test Stand Assembly. The test stand assembly ((11), fig. 1) consists of a wood rack assembly (8) that supports a large tube (7), a small tube (10), and a scale (9) which is graduated in equal units from 0 to 300. Two 25-inch lengths of rubber tubing (4) connect

the hand driven reciprocating pump to the neck end of the inverted large and small tubes. The tubes are open at the top to test fluid can be added to record the test fluid level changes on the scale and to observe the steady flow of air bubbles in the tubes. The large tube is used to test portable fuel and chemical agent tanks and associated hose and gun groups. The small tube is used to test portable pressure tanks and high pressure sphere assemblies. The large tube is 1.75 inches in diameter and the small tube is 1 inch in diameter. Both tubes are 21.5 inches long.

c. Hand Driven Reciprocating Pump. The hand driven reciprocating pump (3) contains two single action plunger type cylinders. The pump will deliver up to 6,000-psi discharge pressure and contains a pressure release control lever (5). One pump lever (2) is operated by a removable pump lever handle (14). One preformed packing and applicable packing rings are used with the pump to insure pressure sealed connections. The pump is mounted on top of a tank (16) which has a capacity of approximately 350 cubic inches and provides the reservoir of test fluid for the tests. A tank drain plug (15) is provided for draining the tank. One 90° pipe elbow (17) screws (⅜–18 NPT) into the side of the pump chamber. A pipe nipple (18) is 8 inches long and screws (⅜–18 NPT) into the other end of the pipe elbow. A bleeder valve (19) is installed between the 8-inch pipe nipple and a pressure gage (1) which is scaled from 0 to 6,000 psi. The pressure gage scale has 120 intermediate graduations, figure intervals of 500, and is ap-



1 Testing gage adapter
2 Testing gage adapter
3 Filling plug assembly
4 Tank adapter
5 Performed packing
6 Preformed packing
7 Pipe-to-tube adapters
8 Plug assembly
9 Tube reducer
10 Check valve body
11 Diffusion pipe plug
12 Coupling half quick disconnect
13 Plug assembly
14 Diffusion pipe plug

Figure 3. M5 test set fittings.

proximately 6 inches in diameter. The pressure gage is vented by the bleeder valve.

d. Additional Fittings Required To Complete the M5 Test Set.

(1) *Preformed packings.* Preformed packings made of synthetic rubber are used to make leakproof seals between two mating surfaces. One preformed packing ((5), fig. 3) is used with the testing gage adapter described in paragraph (2)(*a*) below. Another preformed packing (6) is used with another testing gage adapter and a filling plug assembly described in paragraphs (2)(*b*) and (3) below. Additional preformed packings are used with the pump assembly (para 23).

(2) *Testing gage adapters.* Two testing gage adapters are used during testing the flame thrower fuel tanks.

(*a*) One testing gage adapter (1) is about 2 inches in diameter and is used to test the fuel tank of the M9 tank group and associated hose and gun group.

(*b*) The remaining testing gage adapter (2) is about 1¼ inches in diameter and is used to test the fuel tank of the M2A1 tank group and associated hose and gun group.

(3) *Filling plug assembly.* The filling plug assembly (3) is used to plug the opening in the top of the M3 agent tank after the pipe-and-cap assembly has been removed.

(4) *Tank adapter.* One tank adapter (4) replaces the filling plug in the 1½-gallon tank. A length of rubber tubing ((4), fig. 1) is positioned on a tube assembly and connects onto the open end of the tank adapter.

(5) *Straight pipe-to-tube adapters.* Three straight pipe-to-tube adapters ((7), fig. 3) have both ends threaded. One end has ½–13 UNC–2A threads and the opposite end has ¼–18 NPT threads. Two straight pipe-to-tube adapters screw into the openings in the testing gage adapters described in (2) above. The third adapter is used with the quick-disconnect coupling half to connect the 6-foot long valve and hose assembly to the M9 tank group high pressure sphere assembly.

(6) *Plug assembly.* One high pressure plug assembly (8) replaces the check valve safety disk plug assembly when performing volumetric pressure tests on the M9 tank group high pressure sphere assembly.

(7) *Tube reducer.* One tube reducer (9) contains threads on both ends. One end contains 7/16–20 UNF–3A threads and screws into the high pressure air hose. The other end contains ½–13 UNC–2A threads and screws into the 6-foot rubber hose assembly valve when testing the M9 high pressure sphere assembly with the air hose attached.

(8) *Check valve body.* One check valve body (10) is threaded with ½–13 UNC–2A threads on one end and ½–20 UNF–2A threads on the other end. The check valve body does not have a check valve (ball and spring) and replaces the check valve on the M2A1 pressure tank during testing.

(9) *Diffusion pipe plugs.* Two diffusion pipe plugs (11) and (14) are used to seal off the open end of the diffusion pipes on the M2A1 tank group and the M9 tank group respectively. Each of these plugs is metal stamped for positive identification.

(10) *Coupling half quick disconnect.* One coupling half quick-disconnect (12) is used with the M9–7 high pressure sphere. One end has a ¼–18 NPT threaded female connection for receiving one straight pipe-to-tube adapter. The other end is fitted with the quick-disconnect onto the high-pressure sphere assembly.

(11) *Plug (rubber hose).* A plug (13) is used to plug the end of the 6-foot long rubber hose assembly valve when determining the temporary expansion of the rubber hose.

5. Functioning

The M5 test set provides a source of hydraulic pressure to perform both hydrostatic and volumetric testing of the tanks on portable flame throwers and riot control dispersers. Hydraulic pressure is supplied by the pump assembly and measured on the pressure gage when hydrostatic testing. The large and small tube assemblies provide a means of measuring the expansion of the tanks when subjected to the hydraulic pressure during volumetric testing.

6. Identification

The M5 test set does not contain any marking. The shipping container is marked as shown in figure 4.

7. Tabulated Data

All numerical data are approximate.

a. General

(1) Weights

Packaged	100 lb
Unpackaged	
Empty	75 lb
Filled	85 lb

(2) Cube

Packaged	7 cu. ft

b. Capacity (max. pressure) ..... 6,000 psi

c. Pressures To Be Applied to Items Undergoing Test

Fuel tank assembly (ABC–M9–7) (also tested with M8 fuel hose and M7 gun connected)	450 psi
Fuel tank assembly (M2A1–7 or M3) (also tested with M8 fuel hose and M7 gun connected)	625 psi
High pressure sphere assembly (M9)	3,350 psi
Pressure tank (M2A1 or M3)	3,350 psi

Figure 4. Identification.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

8. General

Upon receipt of equipment, inspect for completeness (SC 5180-94-CL-E05) and satisfactory conditions. Place the equipment in a serviceable condition by replacing all broken, or unuseable parts.

a. Packaging and Packing.

(1) *Packaging.*

(*a*) *Hydraulic pump assembly.* The gage, bleeder valve, pipe nipple, and fittings down to hydraulic pump housing, and the hydraulic pump lever handle and pressure relief control lever are removed. The hydraulic pump is lubricated in accordance with the manufacturer's instruction. The hydraulic storage tank and the fill and drain plugs are coated with preservative. The hydraulic pump is fully retracted and secured in this position with pressure-sensitive tape. Any openings into the hydraulic pump assembly are covered with the same kind of tape as cited above. The gage and bleeder valve are packaged together in a box and placed into a heat sealed bag. The hydraulic pump lever handle does not require preservation or packaging.

(*b*) *Valve and hose assembly.* The valve and hose assembly fittings are coated with a preservative, cushion-wrapped with grease proof barrier material, and secured with tape.

(*c*) *Test stand assembly.* The test stand assembly is placed in a fiberboard box and sealed with gummed tape.

(*d*) *Miscellaneous fittings.* The pressure release control lever plus ferrous and aluminum miscellaneous fittings have threaded and unpainted surfaces. These items are coated with a preservative. The components are placed together in a paper board folding box and cushioned to prevent either movement or contact with each other. The box is closed and sealed in a waterproof bag.

(2) *Packing.* The M5 test set is received in either an oversea class or type nailed wood or cleated plywood box having internal blocking and bracing as required to prevent movement within the box. Metal straps are used to bind the box and provide support. Stencil markings (fig. 4) on the box identify the M5 test set.

b. Unpacking. Break the metal straps around the box. Remove the box cover, remove the M5 test set, and save the box for reuse.

9. Assembling Test Set

a. Bolt the tank of the hand pump fast to the workbench at its base using the four holes provided. (The attaching hardware is not a part of this equipment.)

b. Make two gaskets of the necessary size from gasket material (FSN 5330-222-2564). Install one gasket between the pump chamber and the cover plate of the tank and install the other gasket between the tank cover plate and the tank body. Draw the bolts up tight at both locations.

c. Remove the fitting plug from the tank. Fill the tank with test fluid (para 22). Lute the tank adapter with pipe thread-sealing com-

pound and install the tank adapter in the filling plug opening in the top of the tank. Save the filling plug for reuse.

d. Mount the rack assembly on the workbench. Install the large and small tube assemblies in the holes provided in the rack assembly.

e. Connect one length of rubber tubing to the bottom of the large tube assembly. Connect the second length of rubber tubing to the bottom of the small tube assembly.

Note. If the test is to be made of fuel tanks or agent tanks, connect the rubber tubing from the large tube assembly to the tank adapter on the tank. If the test is to be made of pressure tanks or high pressure sphere assemblies, connect the rubber tubing from the small tube assembly to the tank adapter on the tank.

f. The 90° street elbow can only be installed in the side of the pump chamber when the pump is separated from the tank. Lute the external threads of the heavy-duty 90° street elbow with pipe thread-sealing compound and thread it into the hole in the side of the pump opposite the pressure release control lever. Draw the elbow up tight. Attach the pump to the tank.

g. Lute the threads on both ends of the 2-inch heavy-duty pipe nipple and the heavy-duty bushing. Connect the bushing to the opening in the pump chamber (back) and then connect one end of the pipe nipple into the open end of the bushing. Draw the connections tight. Connect the 6-foot rubber hose assembly to the free end of the 2-inch pipe nipple and draw the connection tight. Close the spindle on the valve end of the 6-foot rubber hose assembly (fig. 2).

h. Lute the threads of the stem of the pressure gage with pipe thread-sealing compound and connect the bleeder valve to stem end. Close the bleeder on the valve. Lute the threads on both ends of the 8-inch heavy-duty pipe nipple with the pipe thread-sealing compound and connect one end into the 90° street elbow. Draw it up tight. Connect the ⅜ national pipe thread end of the bleeder valve to the pipe nipple and draw the threads up tight as shown in figure 1.

Note. If used equipment is received, inspect the M5 test set as described in paragraph 8 and assemble the test set as described in this paragraph.

10. Controls and Instruments

a. Controls

(1) *Bleeder valve.*

(*a*) *Location.* The bleeder valve ((2), fig. 5) is located between the pressure gage and the 8-inch pipe nipple assembled as shown in figure 1.

(*b*) *Purpose.* The bleeder valve provides the means for releasing the test fluid pressure from the pressure gage.

(2) *Spindle assembly.*

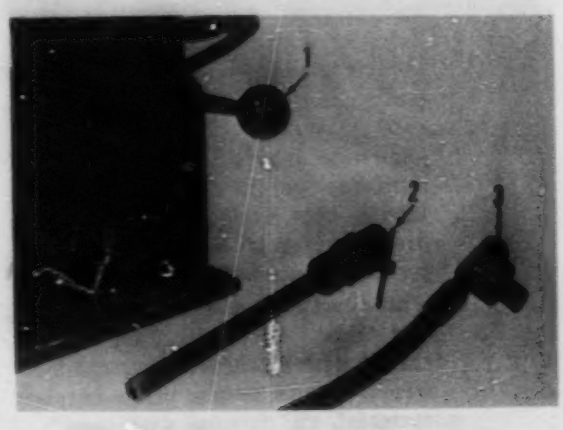
(*a*) *Location.* The spindle assembly (3) is located on the valve assembly end of the 6-foot hose assembly.

(*b*) *Purpose.* The spindle assembly is used to bleed off trapped air.

(3) *Pressure release control lever.*

(*a*) *Location.* The pressure release control lever (1) is located on the pump chamber.

(*b*) *Purpose.* The pressure release control lever is used to control a one-way pressure valve. When the pressure release control lever is closed, pressure from the pump is allowed to charge the equipment but the pressure is restricted from reentering the pump. When the pres-



1 Pressure release control lever
2 Bleeder valve
3 Spindle assembly

Figure 5. Controls.

sure release control lever is open, the pressure is allowed to reenter the pump and the pump tank.

b. Instruments.

(1) *Dial-indicating pressure gage.*

(*a*) *Location.* The dial-indicating pressure gage is located directly above the bleeder valve as shown in figure 1.

(*b*) *Purpose.* The pressure gage is used to indicate the pressure applied by the hand pump to the equipment undergoing test.

(2) *Large and small tube assemblies.*

(*a*) *Location.* The large and small tube assemblies are located in the rack assembly.

(*b*) *Purpose.* The large and small tube assemblies are used to indicate the change in volume of the item being tested.

Section II. OPERATION UNDER USUAL CONDITIONS

11. Identifying Items To Be Tested

The equipment to be tested is the pressure tank and the fuel tank that together make up the M2A1 tank group, and the high pressure sphere assembly and the fuel tank that together make up the M9 tank group. Also the agent tank, the pressure tank of the M3 portable riot control agent disperser, the M7 gun group, and the M8 hose are to be tested using this equipment. Figures 6 through 12 illustrate each of these items attached to the test set.

12. Preparation For Use

a. Prepare Test Fluid. The test fluid consists of a mixture of cutting oil and water. The test fluid is mixed in a ratio of 16 parts of water to one part cutting oil. Approximately 5 gallons of the test fluid are required.

b. Determine Temporary Expansion of 6-Foot Rubber Hose Assembly (Volumetric Test Only). Before conducting a volumetric test the temporary expansion of the hose must be established for each hose used relative to each of the test stand tube assemblies used. The temporary expansion is determined in the following manner.

(1) Connect the hose assembly to be used to the pump as shown in figure 2, and install a plug ((13), fig. 3) in the hose assembly at the valve assembly connection end.

(2) Fill the tank with the test fluid and install the tank adapter.

(3) Connect the rubber tubing from the tube assembly to be used in the test to the tank adapter (4).

Note. A temporary hose expansion must be obtained for each set of conditions to be experienced during volumetric testing. For example, in testing the M2A1-7 flame thrower, the hose expansion must be determined using the *LARGE* tube assembly at 625 psi, and the *SMALL* tube assembly at 3,350 psi.

(4) Fill the tube with test fluid and bleed air from the hose by opening the spindle until test fluid begins to bleed out of the hose. Open the gage bleeder valve on the pump assembly two turns until test fluid begins to bleed out of the bleeder valve.

(5) Close the pressure relief control lever on the hand pump completely by rotating it in a clockwise direction.

(6) Insert the pump lever handle ((14), fig. 1) and pump until 100 psi pressure is shown on the pressure gage. Raise the pump lever to raise the pump plunger and remove the pump lever handle.

(7) Release the pressure release control lever by rotating it about three-quarters of a turn in a counterclockwise direction. Observe the bubbles in the tube assembly. Increase the pressure again to about 100 psi. Elevate the hose assembly and bleed any trapped air by cracking the spindle. When all air has escaped, close the spindle. Release the pressure.

(8) Repeat (7) above until NO bubbles are present in the tube assembly. Refill the tube with test fluid with the pump lever in the UP position and the pump lever handle removed. The pressure release control lever must be in the OPEN position (approx ¾ turn). Record the exact level of the test fluid on the scale.

(9) Close the pressure release control lever and increase the pressure to the required psi for the test to be accomplished (para 7). Record the level of the test fluid on the scale. The difference between the two readings obtained is the temporary hose expansion to be used in the test procedures outlined in paragraph 14.

c. Place the Item To Be Tested Behind a Barricade.

d. Inspect To Make Sure That the Parts of the Item To Be Tested Are Secured by a Wrench or Made Handtight (Whichever Is Applicable) Before Applying Pressure.

e. Inspect To See That the Test Set and the Item To Be Tested Are Filled With Test Fluid.

13. Connecting Items To Be Tested to Test Set

Warning: Release all pressure on items to be tested before attempting to make any connections.

a. Fuel Tank From the M9 Tank Group (With Pressure Regulator Assembly Removed).

(1) Remove one filler cap assembly from the fuel tank.

(2) Loosen the bleeder valve in the other filler cap assembly.

(3) Install the applicable solid diffusion pipe plug (from the test set) in the opening in the connector diffuser tube assembly. The plug is stamped M9–7.

(4) Install the outlet plug in the fuel outlet nipple or quick-disconnect coupling.

(5) Fill the fuel tank with test fluid and when the test fluid comes out the filler cap bleeder valve, close the bleeder valve.

(6) Install the testing gage adapter (approx 2-in. diam) in the exposed filler cap opening.

(7) If a straight pipe-to-tube adapter with ½–13 UNC–2A by ¼–18 national pipe threads is not installed in the hole in the center of the testing gage adapter, install it ((7), fig. 3).

(8) Connect the 6-foot rubber hose assembly to the straight pipe-to-tube adapter in the center of the testing gage adapter.

(9) Fill the pump tank with test fluid and install the tank adapter.

(10) Connect the large tube and rubber tubing to the tank adapter.

(11) Fill the large tube with test fluid and open the gage bleeder valve two turns until fluid bleeds out. Close the bleeder valve. Bleed the trapped air from the test set by operating the pump several times. Notify the operator that the test set is ready to use in performing the test procedure prescribed in paragraph 14.

b. Fuel Tank From the M2A1 Tank Group (With Pressure Regulator Assembly Removed).

(1) Remove one filling plug assembly from the fuel tank of the M2A1 tank group.

(2) Loosen the stem handle in the other filling plug assembly.

(3) Install the applicable solid diffusion plug (from the test set) in the opening in the diffusion pipe coupling nut. The plug is stamped M2A1–7.

(4) Install the outlet plug in the fuel outlet nipple or quick-disconnect coupling.

(5) Fill the fuel tank with test fluid and when the test fluid comes from the loosened stem handle, close the stem handle.

(6) Install the testing gage adapter (approx 1⅜-in. diameter) in the exposed filling plug opening.

(7) If a straight pipe-to-tube adapter with ½–13 UNC–2A by ¼–18 national pipe threads it not installed in the hole in the center of the testing gage adapter, install it.

(8) Connect the 6-foot rubber hose assembly to the straight pipe-to-tube adapter in the center of the testing gage adapter.

(9) Fill the pump tank with test fluid and install the tank adapter.

(10) Connect the large tube and rubber tubing to the tank adapter.

(11) Fill the large tube with test fluid and open the gage bleeder valve two turns until test fluid bleeds out. Close the bleeder valve. Bleed the trapped air from the test set by operating the pump several times. Notify the operator that test set is ready to use in performing the test procedure prescribed in paragraph 14.

c. Agent Tank From the Tank Group of the M3 Riot Control Agent Disperser. The procedure for connecting the agent tank to the test set is identical to the procedure for connecting the fuel tank prescribed in *b.* above except that one filler plug must be replaced by the filling plug assembly (FSN 1040–784–9218). Perform the procedures prescribed in *b* above to connect the agent tank.

d. Pressure Tank From the M2A1 Tank Group and/or the M3 Riot Control Agent Disperser Tank Group.

(1) Before connecting the pressure tank to the test set, remove the pressure tank valve as a unit (while the pressure tank is fastened to the bench).

Note. Remove the pressure tank valve as outlined in TM 3–1040–204–14 paragraph 5–7.

(2) Fill the pressure tank with test fluid while holding the tank in an upright position and screw the pressure tank valve back on the pressure tank drawing it up tight.

(3) Close the valve handle to prevent loss of test fluid from the pressure tank.

(4) Temporarily remove the check valve from the pressure tank valve. Install the check valve body ((10), fig. 3) in the pressure tank valve.

(5) Connect the valve end of the 6-foot rubber hose assembly to the check valve body.

(6) With the rubber tubing disconnected from the tank adapter, open the pressure gage bleeder valve two turns until test fluid begins to bleed out of the bleeder valve; then close the bleeder valve and connect the rubber tubing from the small tube to the tank adapter.

(7) Fill the small tube with test fluid and bleed the trapped air from the test set. Notify the operator that the test set is ready to use in performing the test procedure prescribed in paragraph 14.

e. High Pressure Sphere Assembly From the M9 Tank Group.

(1) Remove the hi-pressure valve assembly as a unit from the high pressure sphere assembly and fill the high pressure sphere assembly with test fluid.

(2) While holding the hi-pressure valve assembly with the open end up, install the hi-pressure valve on the high pressure sphere assembly.

(3) Remove the safety disk plug assembly from the hi-pressure valve body and install the ABC–M9–7 high pressure valve solid safety plug assembly in its place ((8), fig. 3).

(4) For volumetric testing attach the 6-foot rubber hose assembly directly to the quick-disconnect coupling half threaded end and then connect the quick-disconnect coupling half to the valve plug as shown in figure 9.

Note. Instructions in *d* (5) and (6) above are applicable to hydrostatic testing. This separation of steps allows for pressure testing of the pneumatic hose assembly as shown in figure 10.

(5) Attach the pneumatic hose assembly to the valve plug on the hi-pressure valve assembly. Connect the pressure bottle hose adapter to the other end of the pneumatic hose assembly.

(6) Connect the 6-foot rubber hose assembly to the open end of the pressure bottle hose adapter.

(7) With the rubber tubing disconnected from the tank adapter, open the gage bleeder valve two turns until test fluid

begins to bleed out of the bleeder valve; then close the bleeder valve and connect the small tube and rubber tubing to the tank adapter.

(8) Fill the small tube with test fluid and bleed the trapped air from the test set. Notify the operator that the test set is ready to use in performing the test procedure as prescribed in paragraph 14.

f. M8 Hose and M7 Flame Gun. The M8 hose and M7 flame gun are hydrostically tested when connected to the fuel tank of the ABC–M9–7 or M2A1–7 flamethrower. The procedure for connecting the M8 hose and M7 flame gun to the ABC–M9–7 or M2A1–7 flamethrower fuel tank is identical to the procedure outlined in *a* and *b* above except for *e*(4) above. Connect the M8 hose and M7 flame gun to the fuel outlet nipple in place of the outlet plug indicated in *e*(4) above.

14. Test Procedures

Warning: **Isolate the test apparatus and test specimens during the performance of any pressure tests.**

Warning: **Use a portable safety shield mounted on casters when making a visual observation for leakage. The shield must be of sufficient strength to withstand any impact resulting from a rupture of a test specimen and/or apparatus.**

Warning: **The test specimens and other pieces of equipment capable of being ejected in the event of a rupture must be firmly anchored.**

a. M2A1 Fuel Tank. This fuel tank (fig. 6) is from the M2A1 tank group. The M2A1 tank group is a major group of the M2A1–7 portable flame thrower (TM 3–1040–204–14). This is a volumetric test.

(1) Inspect to see that the test set and the fuel tank have been completely assembled, filled, and connected.

(2) All air must be eliminated from the test set and the M2A1 fuel tank undergoing test before conducting the test. Close the pressure release control lever on the hand pump completely by rotating it in a clockwise direction.

(3) Insert the pump lever handle in the place provided for it in the pump lever and pump up a little pressure (about 100 psi) as indicated on the pressure gage. Raise the pump lever to raise the pump plunger and remove the pump lever handle.

(4) Release the pressure release control lever by rotating it about three-quarters of a turn counterclockwise. Observe the bubbles in the tube assembly. Increase the pressure again to about 100 psi indication on the pressure gage, and then elevate the fuel tank (in an upright position) above the test set and crack open the bleeder valve in the filling plug of the fuel tank. When all air has escaped, close the bleeder valve. Crack open the spindle in the 6-foot rubber hose assembly. When all air has escaped, close the spindle and lower the fuel tank. Be sure that approximately 100-pounds of pressure is maintained while bleeding.

(5) Observe the bubbles in the tube assembly and when no bubbles are present, the test set is clear of air. Repeat (4) above until the bleeding operation produces test fluid with no air bubbles.

(6) Place the M2A1 fuel tank behind a portable barricade or in a steel or wood box to stop the stream of test fluid in case of rupture.

(7) Refill the tube with test fluid to near the top of the graduated scale while the pump lever is UP and the pump lever handle is removed. The pressure release control lever must be open approximately three-quarters of a turn. Record the exact level of the test fluid reading on the scale. Close the pressure release control lever. Pump up the pressure as indicated on the dial-indicating pressure gage to 625 psi. If the pressure drops significantly during this test, it indicates a leak. Check for leaks before continuing this test. No leaks must occur during this test, especially while full pressure is being applied. If there are leaks, note place where leak is occurring, release the pressure, and then notify direct support maintenance personnel.

(8) Record the position of the test fluid (reading) on the scale while 625 psi pressure is applied. Hold this pressure for approximately 60 seconds or longer to allow time for complete expansion of the M2A1 fuel tank. When the test fluid level in the tube stops dropping, the expansion of the M2A1 fuel tank is completed.

(9) Remove the pump lever handle with the pump lever in UP position *before* releasing the pressure release control lever; then release the pressure release control lever by opening it approximately three-quarters of a turn to observe the test fluid rise in the tube. When the pressure gage indicates zero and the test fluid has stopped rising, record the level of the test fluid remaining in the tube.

(10) Subtract the reading observed here from the reading observed at the start of the test. This is the permanent expansion of the fuel tank. Divide the temporary expansion (less the hose expansion) into the permanent expansion and this is the ratio between the two. If the ratio is less than 10 percent, the fuel tank is acceptable. If the ratio is more than 10 percent, recheck the test set for presence of air or for leaks before rejecting the M2A1 fuel tank.

(11) An example of calculating the permanent expansion is as follows:

Level of test fluid in tube at start of test = 290 on the scale.

Level of test fluid column in tube at a pressure of 625 psi = 70 on the scale.

$$\begin{array}{r} 290 \\ -\ 70 \\ \hline 200 \end{array} = \text{Total temporary expansion.}$$

$$\frac{-20}{200} = \text{Total temporary hose expansion.}$$

= Total temporary tank expansion.

Test fluid column was at 290 at start of test.

Test fluid column returns to 280 at end of test.

Total permanent expansion = 10.

Permanent expansion $\frac{10}{200} = 5\%$.

Tank is acceptable.

(12) When the test procedure is performed to this point, have direct support maintenance personnel disconnect the M2A1 fuel tank and connect another M2A1 fuel tank.

(13) When performing a hydrostatic test, the test pressure is applied and held for 60 seconds or more. If no pressure drop occurs, the unit is acceptable.

b. M9 Fuel Tank. This M9 fuel tank (fig. 7) is from the M9 tank group. The M9 tank group is a major group of the ABC–M9–7 portable flame thrower (TM 3–1040–211–30). This is a volumetric test.

(1) Inspect to see that the test set and the M9 fuel tank have been completely assembled, filled, and connected by direct support maintenance personnel.

(2) Perform the test procedure as prescribed in *a* above to complete the test of this M9 fuel tank, except the test pressure to be used in 450 psi.

c. M2A1 Pressure Tank. The M2A1 pressure tank (fig. 8) is from the M2A1 tank group. The M2A1 tank group is a major group of the M2A1–7 portable flame thrower (TM 3–1040–204–14). This is a volumetric test.

(1) Have direct support maintenance personnel assemble, fill, and connect the M2A1 pressure tank to the test set.

Note. Inspect to see that the rubber tubing is connected from the small tube to the tank adapter when testing the M2A1 pressure tank.

(2) Perform the test procedure as prescribed in *a* above with the exception that the test pressure must be 3,350 psi to complete the test of this pressure tank.

d. High Pressure Sphere Assembly. The high pressure sphere assembly is from the M9 tank group. The M9 tank group is a major group of the ABC–M9–7 portable flame thrower (TM 3–1040–211–12).

Note. For volumetric testing of the high pressure sphere assembly, the equipment is connected as shown in figure 9. For hydrostatic testing of the high pressure sphere assembly, the equipment is connected as shown in figure 10.

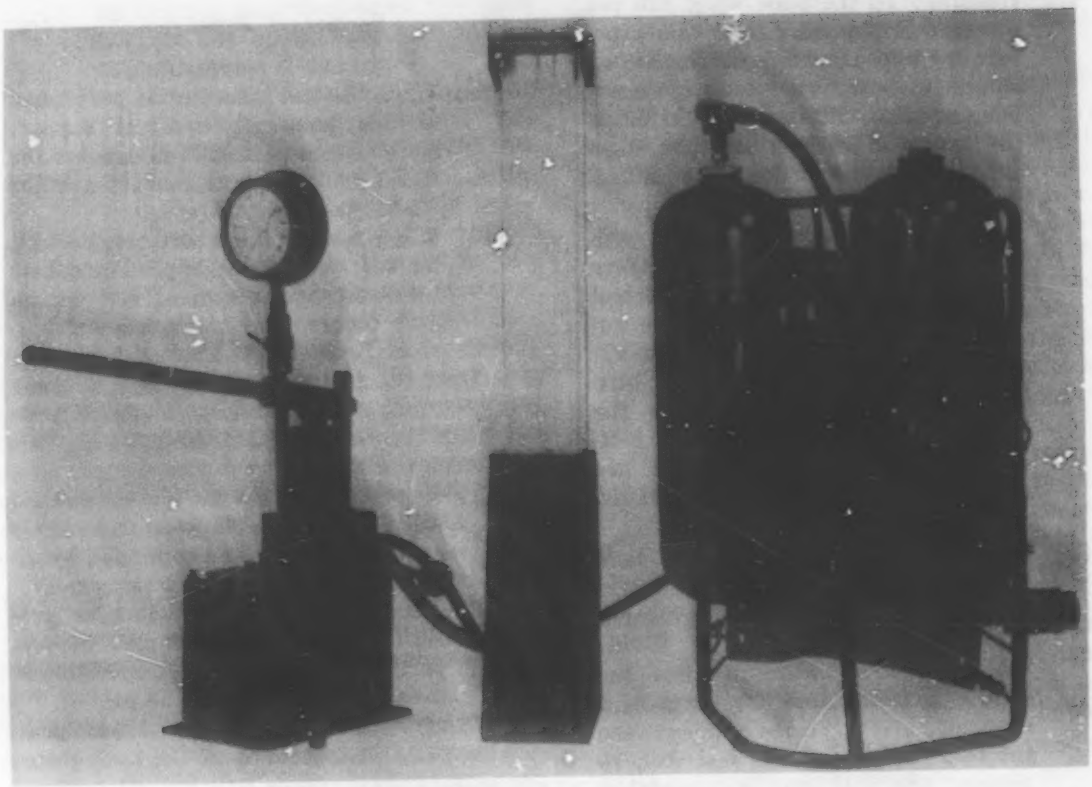


Figure 6. Fuel tank (M2A1 flame thrower or M3 riot control agent disperser) attached to test set for volumetric test.

(1) Inspect to see that the test set and the high pressure sphere assembly have been completely assembled, filled, and connected by direct support maintenance personnel.

Note. Inspect to see that the rubber tubing is connected from the small tube to the tank adapter when testing the high pressure sphere assembly.

(2) Perform the test procedure as prescribed in *a* above with the exception that the test pressure is 3,350 psi to complete the test of this high pressure sphere assembly.

e. Agent Tank. The agent tank is from the M3 portable riot control agent disperser (TM 3–1040–214–12). This agent tank is exactly like the M2A1 fuel tank described in *a* above. A filling plug assembly ((3), fig. 3) is required (from the test set) to replace the pipe-and-cap assembly while the agent tank is being teste Perform the test procedure as prescribed in above to complete the test of this agent ta

f. Pressure Tank. This pressure tank is fr the M3 portable riot control agent disper (TM 3–1040–214–12). This pressure tank exactly like the pressure tank described in above. Perform the test procedure as prescrib in paragraph *c* above to complete the test of t pressure tank.

g. M8 Hose and M7 Flame Gun. Connect M8 hose and the M7 flame gun to the M2A1 f tank and hydrostatically test to a pressure 625 psi in accordance with the procedure p scribed in *a* above. The test setup is as ill trated in figure 11. The M8 hose and M7 fla gun are to be connected to the M9 fuel tank hydrostatically tested to a pressure of 450 ps accordance with the procedure prescribed i

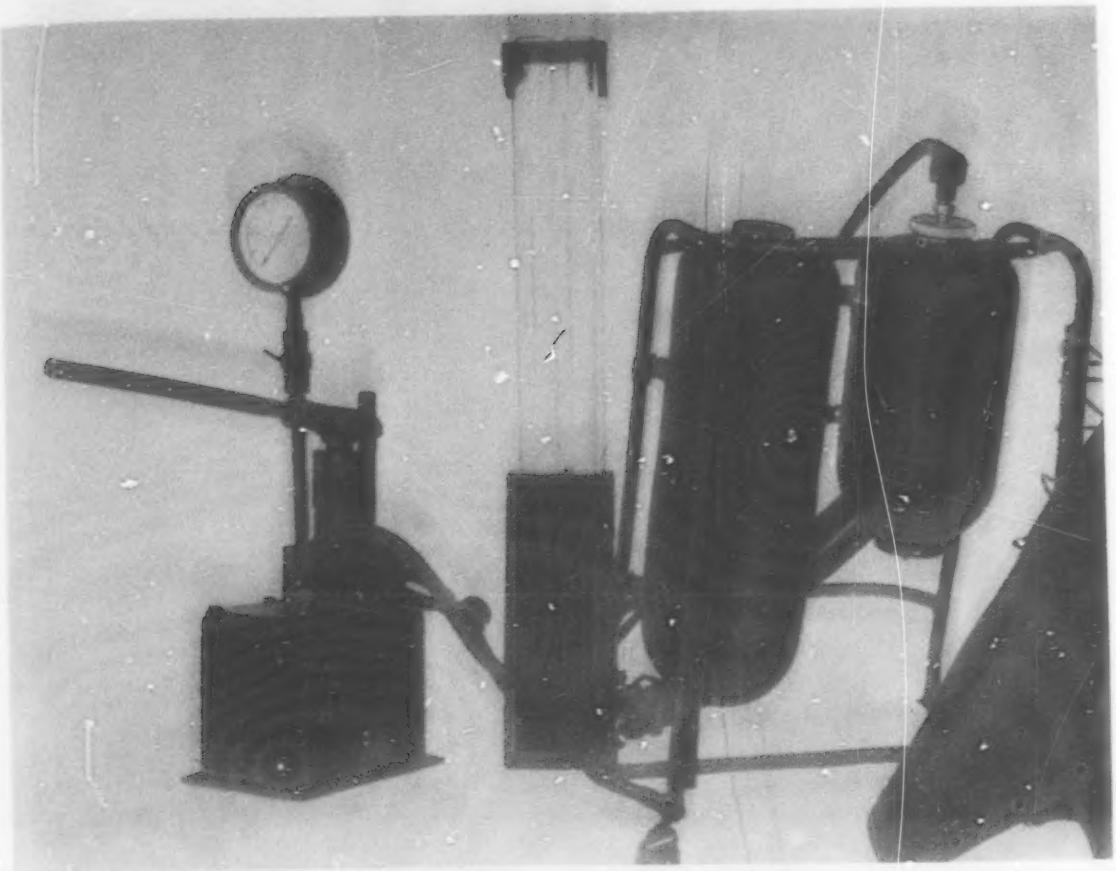


Figure 7. M9 fuel tank attached to test set for volumetric test.

above. The test setup is as illustrated in figure 12.

15. Removing Tested Items From Test Set

Warning: **Always release all pressure on the test set before attempting to make any adjustments, repairs, or disassembly of the test set.**

Warning: **Always release all pressure on any item or unit being tested before attempting to make any connection, adjustment, repair, or disassembly.**

a. Disconnect the item that underwent testing from the test set.

b. Drain the test fluid from the item that was tested. Mop up test fluid inside the tank with a rag on a piece of wire. Finish drying out the inside of it thoroughly using compressed air. Inspect to see that the fuel tank, pressure tank, agent tank, or high pressure sphere assembly are thoroughly clean and dry.

c. If the fuel tank, pressure tank, agent tank, or high pressure sphere assembly pass the test satisfactorily, paint or stencil the test date (month and year) as well as the unit identification code on the equipment. Paint or stencil this information on the shoulder of the pressure tank, on the neck of the high pressure sphere assembly, and on the shoulder of the fuel tank and/or agent tank.

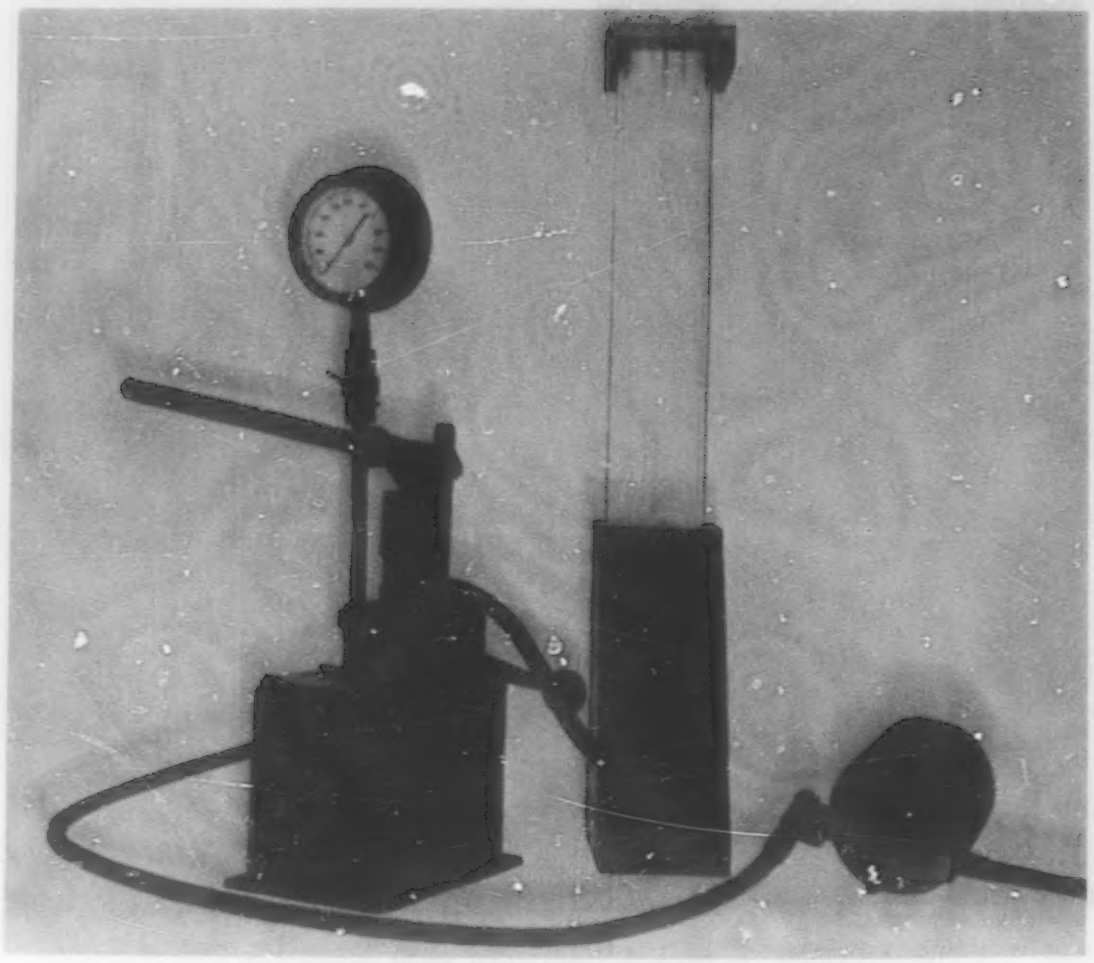


Figure 8. Pressure tank (M2A1–7 flame thrower or M3 riot control agent disperser) attached to test set for volumetric test.

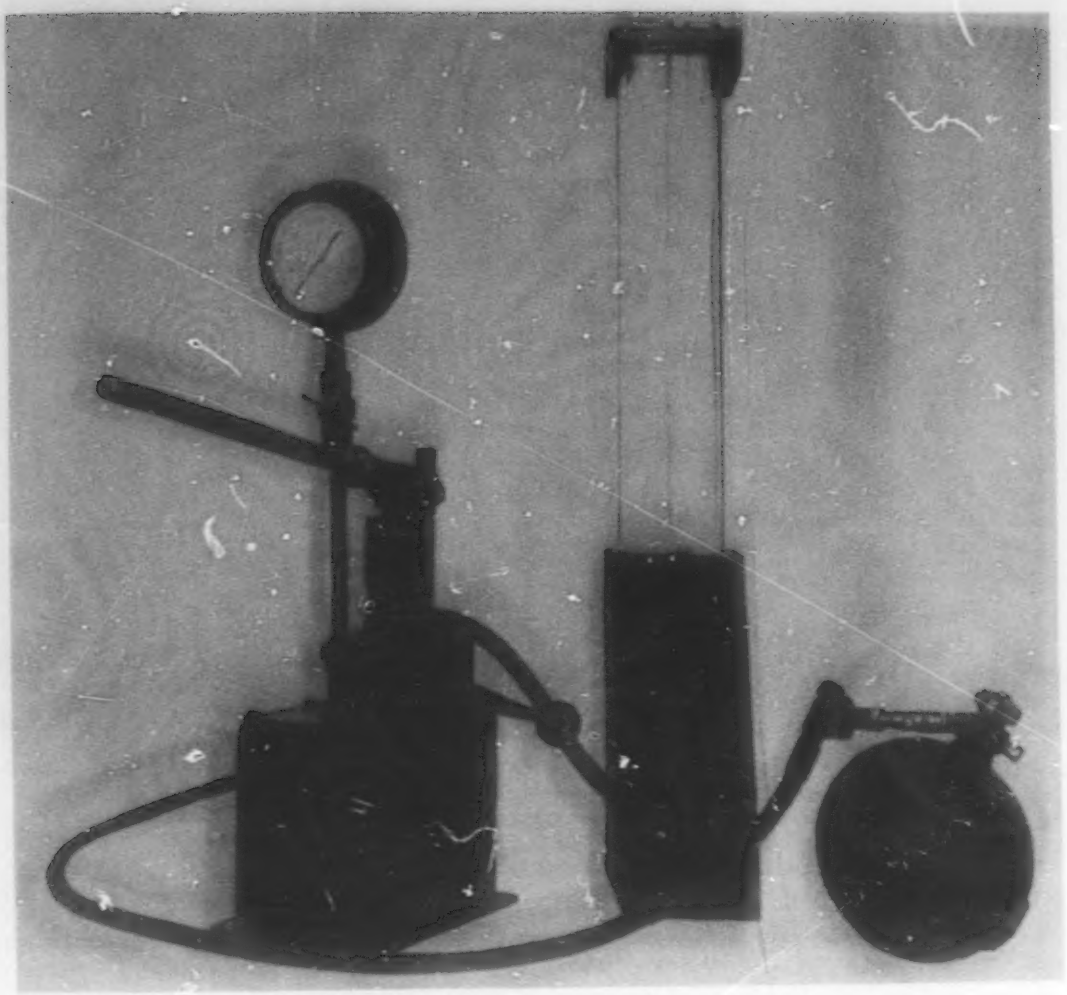


Figure 9. High pressure sphere assembly (without pneumatic hose assembly) attached to test set for volumetric test.

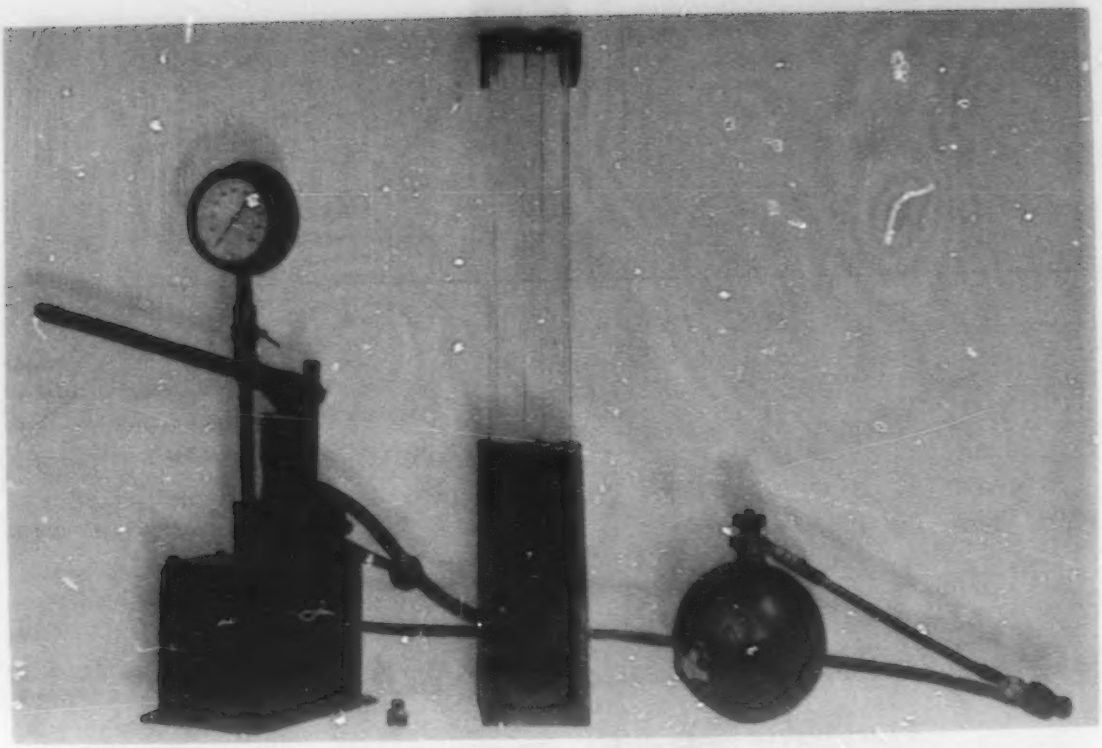


Figure 10. High pressure sphere assembly (with pneumatic hose assembly) attached to test set for hydrostatic test.

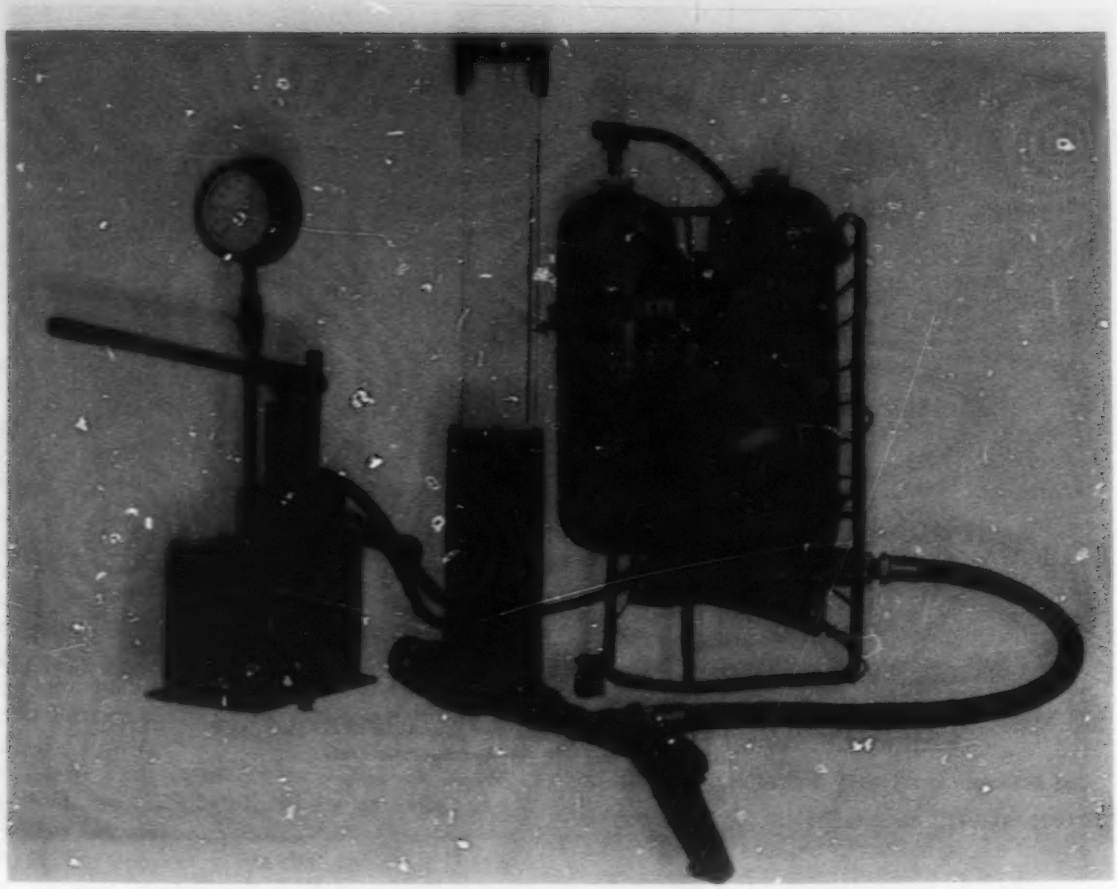


Figure 11. M8 hose and M7 flame gun connected to M2A1 fuel tank attached to test for hydrostatic test.

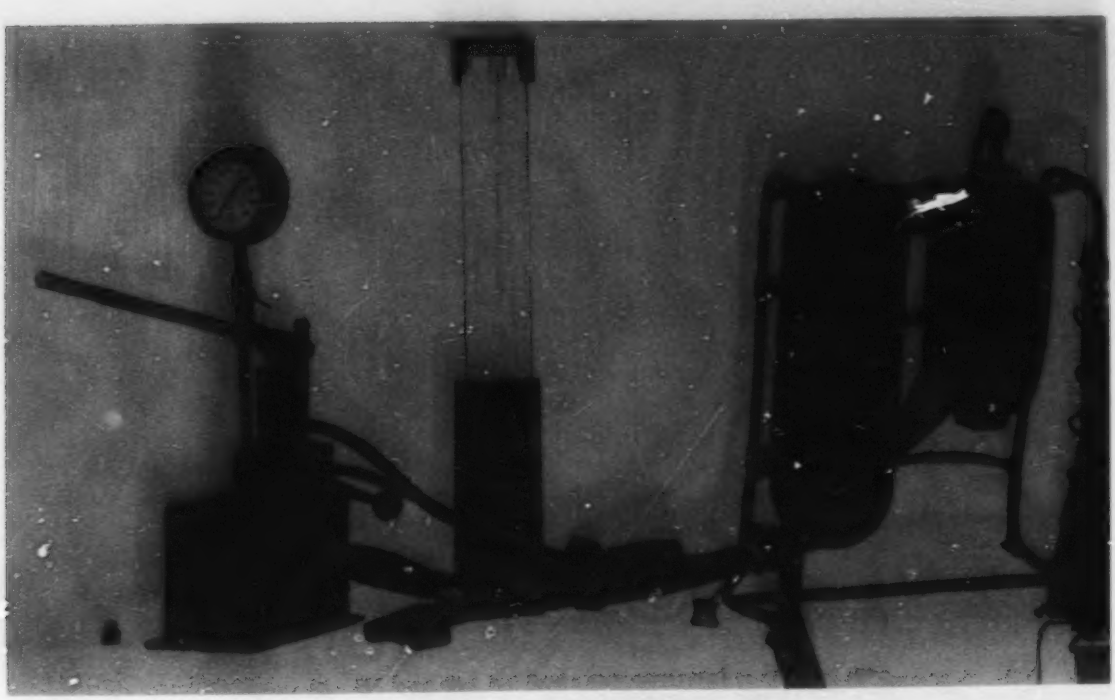


Figure 12. M8 hose and M7 flame gun connected to M9 fuel tank attached to test set for hydrostatcic test.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. OPERATOR PREVENTIVE MAINTENANCE

16. Before-Operation Inspection and Servicing

a. Purpose. The purpose of the before-operation inspection and servicing is to determine whether the test set is in good operating condition.

b. Rubber Tubing. Clean the rubber tubing and examine it for breaks, cracks, fraying, or other signs of deterioration. Give special attention to the portions of the rubber tubing near the tank adapter and near the base of the large and small tubes where most of the flexing occurs during use. Replace the hose if it is faulty.

c. Large and Small Tubes. Inspect to see that the large and small tubes are unbroken and that they are clean.

d. Scale. Inspect to see that the scale is not dirty or rust spotted. Inspect to see that the scale graduations (zero to 300) are easy to read. Clean with drycleaning solvent (Stoddard) if necessary.

17. After-Operation Services

Warning: **Release all pressure on the test set, item, and unit being tested before attempting to make any adjustment, repair, or separation (disassembly) of the test set, item, and unit being tested.**

a. Release the pressure by opening the pressure release control lever by rotating it in a counterclockwise direction approximately three-quarters of a turn.

b. Open the bleeder on the bleeder valve assembly and release any test fluid which may be present in the pressure gage lines.

c. Remove the tested item from the test set.

d. See that all miscellaneous fittings (para 4*d*) used during the performance of the testing are on hand, clean, and properly stowed.

e. See that the test set is not dirty; if necessary clean exterior surfaces with drycleaning solvent and dry with compressed air.

Section II. DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

18. General

a. Direct support maintenance personnel are authorized to perform all maintenance, to perform inspection and troubleshooting of the test set for physical damage, looking for such deficiencies as rust, cracks in rubber tubing, broken lens on the pressure gage, cracked tubes, damaged threads on threaded components, and evidence of leaking gaskets. In addition they are authorized to replace all worn or broken components of the test set as required.

b. Direct support maintenance personnel are responsible for collecting, sorting, and readying the equipment to be tested. In addition direct support determines whether the tested equipment is to be returned to service or rejected. Rejected equipment will be turned in to general and depot maintenance personnel.

19. Painting

To prevent rusting of metal parts, paint all areas that need repainting. For special painting instructions, refer to TM 9–213.

20. Paints to be Used

a. Primer. Prime all worn and scratched surfaces with one coat of pretreatment primer,

Military Specification MIL–C–15328. Allow it to dry thoroughly before applying the final coat of paint.

b. Final Coat. Paint exterior surfaces with two coats of rust-inhibiting semigloss enamel, Federal Specification TT–E–485. After applying the final coat of paint, restore all markings.

Section III. TROUBLESHOOTING

21. General

Each trouble symptom is followed by a list of probable causes of the trouble. The possible remedy is described opposite the probable cause.

22. Pressure Low or Falling

Probable cause	*Possible remedy*
Gaskets not seated properly.	Tighten bolts or replace worn gaskets
Preformed packing defective.	Replace preformed packing
Hose connections leak	Tighten connections

Section IV. REPLACEMENT OF WORN PARTS

23. Repair of Hand Pump

a. General. Repair of the pump is limited to replacement of the preformed packings. The preformed packing is positioned around the stem of the pressure release control lever. Packing is positioned between the pump chamber and the low pressure plunger. Packing is also positioned between the packing gland and the high pressure plunger.

b. Removal of Preformed Packings. Removal of the preformed packings are discussed separately in paragraphs (1) through (3) below:

(1) Pressure release control lever preformed packing. Remove the pressure release control lever ((3), fig. 13) as an assembly from the pump chamber (1) by turning the pressure release control lever handle in a counterclockwise direction until it is free of the pump chamber. Remove the worn preformed packing (2) from the groove around the pressure release control lever stem, and discard.

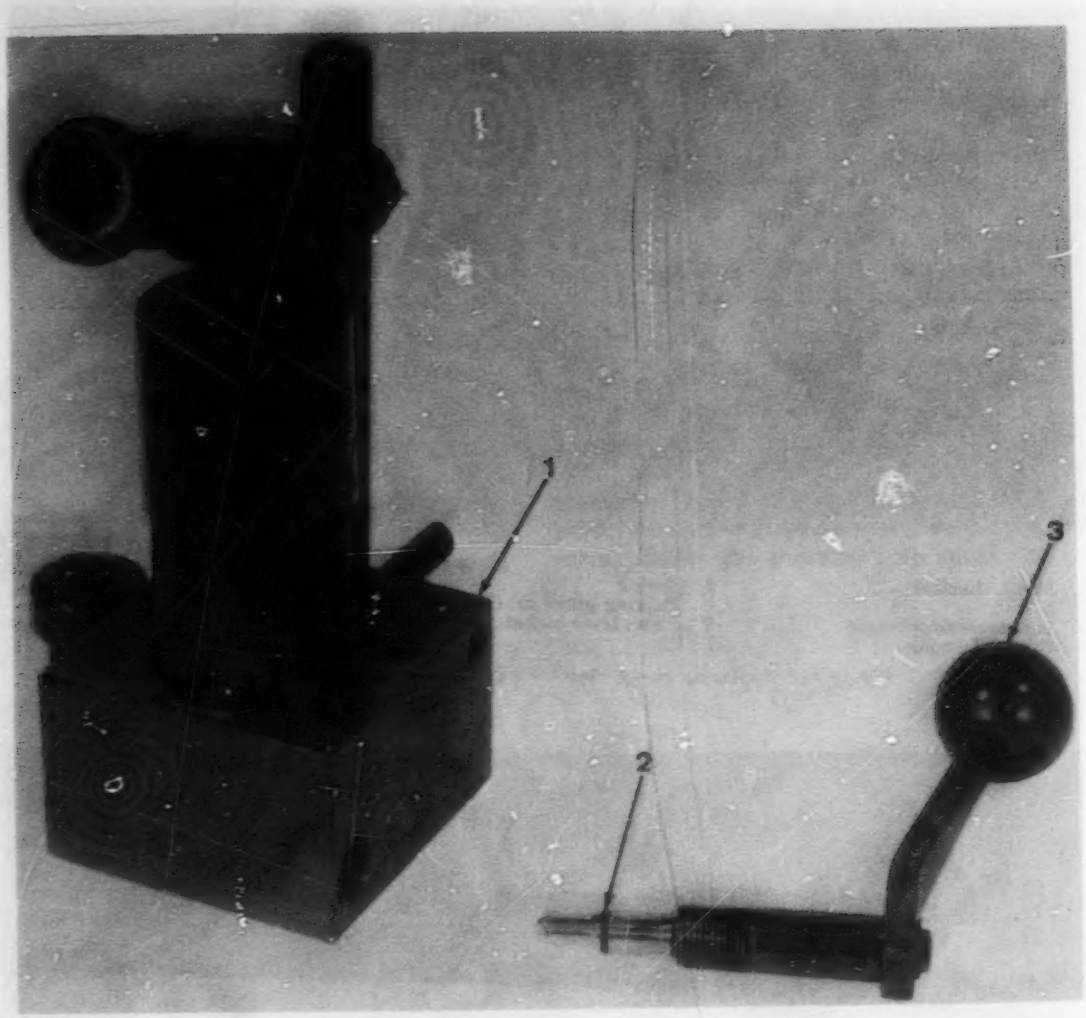
(2) Pump chamber and low pressure plunger packing. Remove the cotter pin ((9), fig. 14) that retains the pin (8) connecting the pump lever socket (7) to the link (2) and remove the pin. Pull the pump lever socket with the high pressure plunger (10) attached out of the packing gland retainer (6). Unscrew the packing gland from the low pressure plunger (3). Lift off the spring shield and pull-back spring (5). Unscrew and remove the up-stop bushing (4). Remove the low pressure plunger from the pump chamber (1). Remove the worn preformed packing (11) from the groove in the low pressure plunger, and discard.

(3) Packing gland and high pressure plunger packing. Remove the cotter pin ((8), fig. 15) that retains the pin (7) connecting the pump lever socket to the link (2) and remove the pin. Pull the pump lever socket with the high pressure plunger (6) attached out of the packing gland retainer (5). Unscrew the packing gland retainer from the low pressure plunger. Lift off the spring shield and pull-back spring (4). Remove the worn preformed packing (3) from inside the low pressure plunger, and discard.

c. Installation of Preformed Packings. Installation of the preformed packings discussed separately in (1) through (3) below:

(1) Pressure release control lever preformed packing. Install a new preformed packing (½- by ⅜- by 1/16-in.) in the groove of the pressure release control lever stem. Screw the pressure release control lever as a unit into the pump chamber in a clockwise direction until it bottoms.

(2) Packing gland and high pressure plunger packing. Place a new pre-

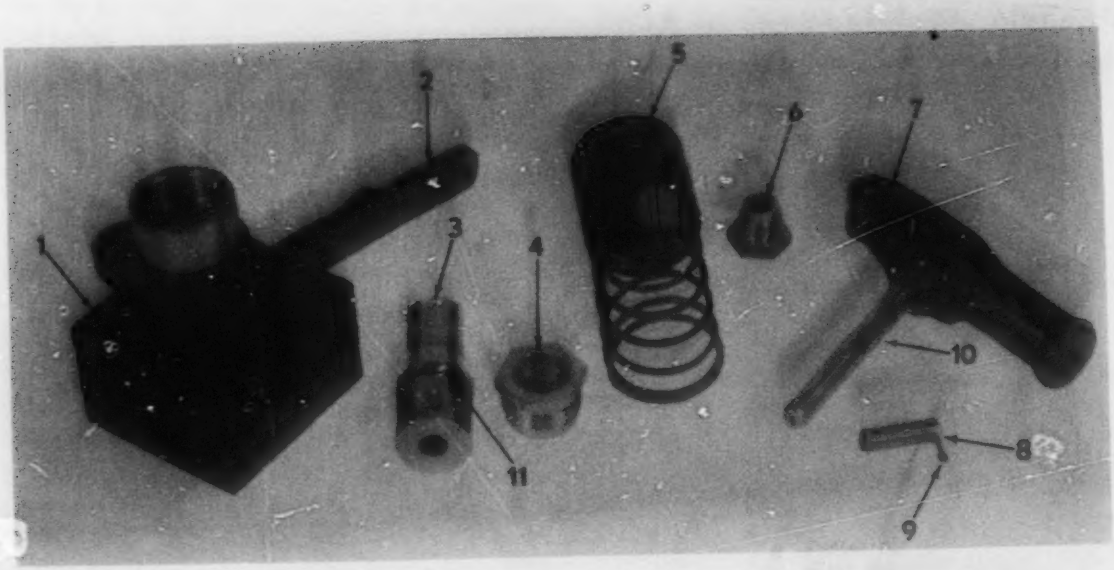


1 Pump chamber 2 Preformed packing 3 Pressure release control lever

Figure 13. Replacing pressure release control lever preformed packing.

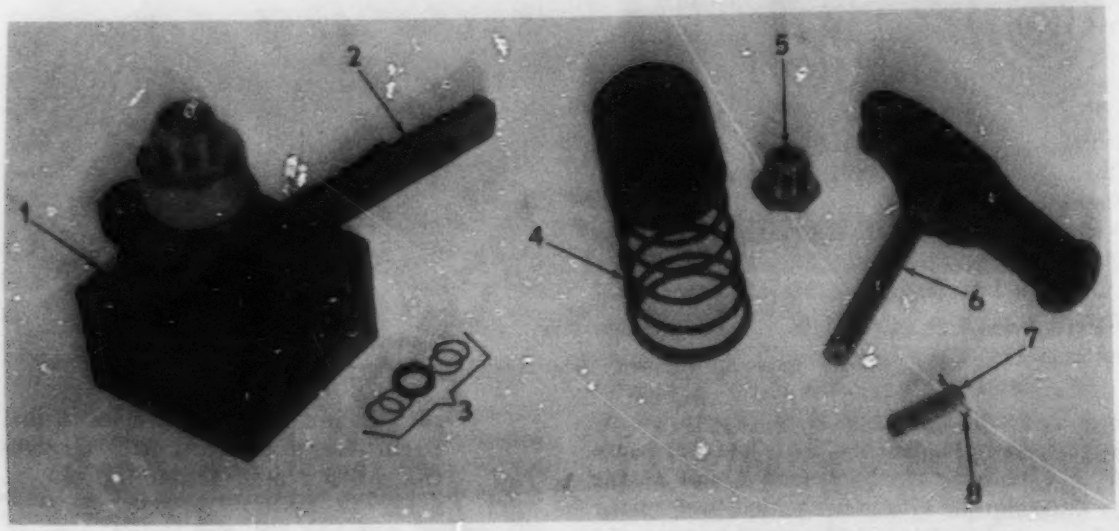
formed packing (9/16- by 13/16- by ⅛-in.) inside the low pressure plunger at the threaded end of the plunger. Position the pull-back spring and spring shield over the upper end of the pump chamber. Screw the packing gland retainer into the low pressure plunger about three turns. Insert the high pressure plunger into the low pressure plunger. Screw the packing gland retainer in the low pressure plunger until it bottoms. Insert the pin through the holes in the pump lever socket and link. Install the cotter pin to fasten the pin in place.

(3) Packing gland and low pressure plunger packing. Install a new preformed packing (1½- by 1¼- by ⅛-in.) in the groove on the outside of the low-pressure plunger casing. Insert the low pressure plunger in the pump chamber. Screw the up-stop bushing into the pump chamber until



1 Pump chamber
2 Link
3 Low-pressure plunger
4 Upstop bushing
5 Spring
6 Packing gland retainer
7 Pump lever socket
8 Pin
9 Cotter pin
10 High pressure plunger
11 Preformed packing

Figure 14. Replacing pump chamber and low-pressure plunger packing.



1 Pump chamber
2 Link
3 Preformed packing
4 Spring
5 Packing gland retainer
6 High pressure plunger
7 Pin
8 Cotter pin

Figure 15. Replacing packing gland and high-pressure plunger packing.

it bottoms. Install the pull-back spring and spring shield around the upper end of the pump chamber. Screw the packing gland retainer into the low pressure plunger about three turns. Insert the high pressure plunger into the low pressure plunger. Screw the packing gland retainer in the low pressure plunger until it bottoms. Insert the pin through the holes in the pump lever socket and link. Install the cotter pin to fasten the pin in place.

24. Replacing Defective Test Stand Assembly Components

a. Removal. To remove the large tube ((7), fig. 1) and small tube (10), loosen the rubber tubing (4) that connects the tubes to the pump tank adapter. Drain the test fluid out of both tubes. Remove the rubber tubing by working the tubing free of the lower end of each tube. Push both tubes up through the top holes of the rack assembly and out of the rack. Discard damaged tubes.

b. Installation. Insert the new tubes in the top or upper holes provided in the rack assembly. Use extreme care not to break the plastic tubes. Attach a length of rubber tubing to the lower end of each tube that protrudes through the lower hole in the rack assembly by working the hose over the end of the tubes. Fit the other end of the rubber tubing over the tank adapter.

25. Replacing Defective Pressure Gage

a. Removal. Remove the pressure gage (1) by unscrewing it from the bleeder valve (19).

b. Installation. Apply pipe thread-sealing compound to the threads of the new pressure gage. Screw the pressure gage into the bleeder valve. Draw the connection up snug.

CHAPTER 4

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

26. Shipment

Prepare the test set for shipment by disconnecting the rubber tubing from the rack assembly and the tank adapter in the pump tank. Coil the rubber tubing in the cavity in the base of each rack assembly and tape the tubing in place. Empty all test fluid from the test set, and dry out all parts. Detach the 6-foot rubber hose assembly from the pump chamber pipe nipple. Detach the pressure gage, bleeder valve and 8-inch pipe nipple from the pump chamber elbow. Crate the test set in the box in which it was received (para 8*a*(2)) and secure with metal straps. If markings have been effaced, mark the outside of the box with a stencil as shown in figure 4.

27. Limited Storage

a. General. Refer to AR 743–41 for information on open storage of equipment and supplies. It is the responsibility of the unit commander to determine the preventive maintenance needs when placing the test set in limited storage. Climate and anticipated weather conditions are factors which will determine the extent of protection required.

b. Cleaning and Painting. Wash off the test set and flush away all foreign matter. Release all air and test fluid pressure and bleed the lines. Cap off all open ends to prevent entry of dust and foreign matter. Protect the glass of the pressure gage and the plastic tubes against breaking by use of pressure-sensitive adhesive tape. Paint the scratched surfaces. If the equipment is being stored outside, follow the procedures listed above and cover the equipment with canvas. Post a marker or sign to identify the test set.

Section II. DEMOLITION TO PREVENT ENEMY USE

28. General Destruction Information

If circumstances force abandonment of the test set to the enemy, it must be destroyed or rendered useless to prevent its use by the enemy. This action will be taken only when in the judgment of the military commander concerned it is deemed necessary. Complete destruction of an end item includes the end item itself, technical manuals, and logbook.

29. Methods of Destruction

Methods of destruction for the test set include explosives, smashings, weapons fire, scattering and concealment, burning and submersion.

APPENDIX I

REFERENCES

AR 755–20	Defense Disposal Manual.
AR 755–21	Excess, Surplus and Foreign Excess Personal Property at Disposal.
AR 755–446	Demilitarization and Mutilation of Certain Military Type Items Prior to Disposal.
TM 3–1040–204–14	Organizational, DS, and GS Maintenance Manual, (Including Repair Parts and Special Tool Lists), Flame Thrower, Portable, M2A1–7.
TM 3–1040–211–12	Operator and Organizational Maintenance Manual, Flame Thrower, Portable, ABC–M9–7.
TM 3–1040–211–30	Field Maintenance Manual, Third Echelon, Flame Thrower, Portable, ABC–M9–7.
TM 3–1040–214–12	Operator and Organizational Maintenance Manual, Disperser, Riot Control Agent, Portable, M3.
TM 3–1040–214–35	Field and Depot Maintenance Manual, Disperser, Riot Control Agent, Portable, M3.
TM 9–213	Painting Instructions for Field Use.
TM 9–1330–200	Grenades, Hand and Rifle.
TM 38–750	The Army Equipment Record Procedures.
FM 5–25	Explosives and Demolitions.
SC–5180–94–CL–E05	Sets, Kits, and Outfits Components List For Maintenance Kit CBR Equipment, M14 (FSN 5180–782–6049).

APPENDIX II

BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. Scope

This appendix references the supply manual that lists items which comprise the Test Set, Flame Thrower, Riot Control Agent Disperser, Hydrostatic and Volumetric, 6,000 PSI, M5.

Section II. BASIC ISSUE ITEMS

Components are listed and illustrated (figs. 3, 4, 5, and 6) in SC 5180–94–CL–E05 for TEST SET, FLAME THROWER, RIOT CONTROL AGENT DISPERSER, HYDROSTATIC AND VOLUMETRIC, 6,000 PSI, M5 (FSN 1040–050–7952).

APPENDIX III

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

1. General

This maintenance allocation chart lists the authorized maintenance functions assigned the maintenance categories for maintenance support of the M5 test set. This chart is to be used by all levels of maintenance to ensure complete support of the equipments.

2. Maintenance Functions

Maintenance functions authorized are limited to and defined as follows:

a. Inspect. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

b. Test. To verify serviceability and to detect electrical or mechanical failure by use of test equipment.

c. Service. To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air.

d. Adjust. To rectify to the extent necessary to bring into proper operating range.

e. Align. To adjust specified variable elements of an item to bring to optimum performance.

f. Calibrate. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

g. Install. To set up for use in an operational environment such as an emplacement, site, or vehicle.

h. Replace. To replace unserviceable items with serviceable assemblies or parts.

i. Repair. To restore an item to serviceable condition. This includes, but is not limited to, inspection, cleaning, preserving, adjusting, replacing, welding, riveting, and strengthening.

j. Overhaul. To restore an item to a completely serviceable condition as prescribed by maintenance serviceability standards using the Inspect and Repair Only As Necessary (IROAN) technique.

k. Rebuild. To restore an item to a standard as nearly as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements (items) using original manufacturing tolerances and specifications, and subsequent reassembly of the item.

l. Symbols. An arabic numeral symbol placed in a maintenance responsible for performing that particular function.

3. Explanation of Format

The purpose and use of the format are as follows:

a. Column (1)—Group Number. Column (1) lists group numbers, if assigned, the purpose of which is to identify components, assemblies, subasssemblies, and modules with the next higher assembly.

b. Column (2)—Functional Group. Column (2) lists the groups, sections, names of components, assemblies, subassemblies, and modules on which maintenance is authorized.

c. Column (3)—Maintenance Function. Column (3) lists the maintenance categories, designated by an arabic numeral (1 through 5) entered under the maintenance function subcol-

umn headings, authorized to perform the indicated function.

d. Use of Symbols. Arabic numerals (symbols) used in column (3) are as follows:

Maintenance function number codes:

1.....Operator
2.....Organizational
3.....Direct support
4.....General support
5.....Depot maintenance

e. Column (4)—Tools and Equipment. Column (4) lists the special tools and test equipment, if required, used in performing the authorized maintenance functions.

f. Column (5)—Remarks. Column (5) explains and identifies the specific operation to be performed in brief language, such as clean, lubricate, straighten, weld, etc.

Maintenance Allocation Chart

(1)	(2)	(3) Maintenance function											(4)	(5)
Group/Index No.	Functional group	Inspect	Test	Service	Adjust	Align	Calibrate	Install	Replace	Repair	Overhaul	Rebuild	Tools and equipment	Remarks
	Pump assembly	1							1	3				
	Test stand assembly	1							1	3				
	Valve and hose assembly	1							1					
	Miscellaneous fittings	1												

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

CNGB (1)
USAMB (2)
USACDC (2)
USACDCCBRA (2)
USACDCDA (2)
USACDCARMA (2)
USACDCARTYA (2)
USACDCAVNA (2)
USACDCIA (2)
USACDCSWA (2)
USAARMC (2)
USAAMC (2)
USAECFB (2)
USAPC (2)
USA Gen Cen (2)
USAIC (2)
USCONARC (10)
ARADCOM (5)
ARADCOM Rgn (5)
USAMUCOM (5)
USAMC (5)
USACDCEC (10)
OS Maj Comd (5)
CAMTMTS (1)
EAMTMTS (1)
WAMTMTS (1)
Armies (5)
USAMA (10)
Svc Colleges (10)
Br Svc Sch (10) except
USACMLS (50)
GENDEP (5)
Dep (5)
A Dep (5)
POE (1)
Instl (2)
USATTC (1)
MOTBA (1)
MOTBY (1)
MOTBR (1)
MOTKI (1)
MOTSU (1)
USAAPSA (5)
Arsenals (3) except
Edgewood (50)
PG (5)
Ft Knox FLDMS (10)
Units org under fol TOE:
3-7 (1)
3-30 (1)
3-47 (1)
3-147 (1)

NG: State AG (3).

USAR: None.

For explanation of abbreviations used, see AR 320-50.

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